



# ELECTRICAL CURRENTS

Newsletter from the Office of the Chief Electrical Inspector

Ron Fuller, Chief Electrical Inspector

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## ● All Electrical Currents Newsletters Now Offered In One Searchable .PDF Document

As requested at the recent stakeholder meetings, we now have a searchable compilation of all 8+ years of the ELECTRICAL CURRENTS newsletter in one Adobe (.PDF) document on our Web site. The document will be updated monthly to include the latest edition and is located at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/WhatsNew/Currents>.

We recommend that you save a copy of the file to your computer's hard drive after each monthly update for quicker access and faster searches throughout the month. The file is too large to distribute on the Electrical Listserv and not recommended for dial-up users. If you have high-speed Internet access and try this feature out, please give us your feedback at: <mailto:electricalprogram@lni.wa.gov>.

## ● Revisions To WAC 296-46B Are On Schedule To Be Effective May 1, 2006

The electrical rule revision process that began with the formation of the Technical Advisory Committee (TAC) and acceptance of proposals from the public in July 2005 is ahead of the original schedule. We expect the rules to be effective May 1, 2006. The accelerated process for this revision cycle was possible due to the small number of revisions proposed or needed because of 2005 legislative action. We want our inspectors, customers, and other stakeholders to be aware of the new requirements. Listed below are summaries of the most important revisions. The complete text of the changes is available online on the Rule Development page at:

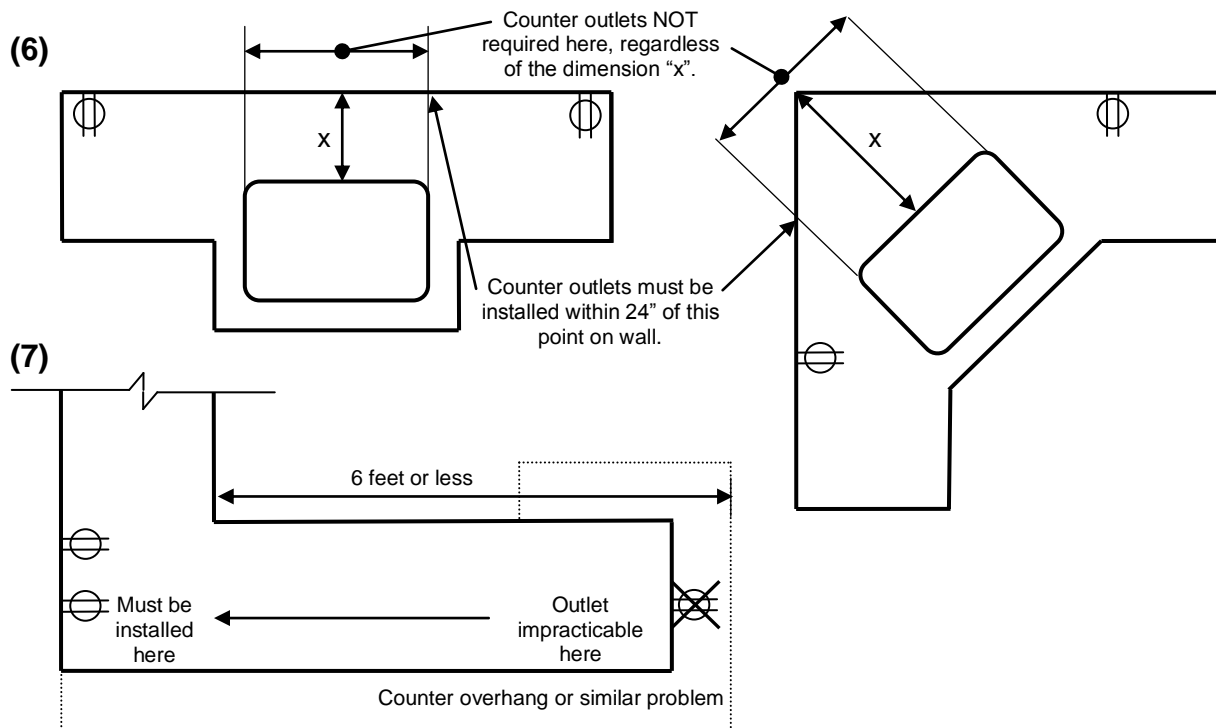
<http://www.lni.wa.gov/TradesLicensing/Electrical/LawRulePol/RuleDev/default.asp>.

- In **WAC 296-46B-010(1)** *The American Railroad Engineering and Maintenance of Way Association—2005 Communications and Signal Manual* was added to the list of adopted standards, primarily to address some of the traffic control systems necessary in the construction of public transportation systems such as light rail.
- In **WAC 296-46B-010(16)** language was restructured to clarify the threshold for small modifications to existing installations that do not require plan review. In reference to NEC 517.2 the term “critical branch circuits and feeders” was replaced with “branch circuits or feeders of an essential electrical system.”
- In **WAC 296-46B-010(Notes to Tables 010-1 and 010-2)** new language makes it clear that places of assembly located within educational and institutional facilities may NOT be done in the wiring methods the NEC now allows for some assembly spaces (i.e. spaces with a specific finish rating or not required to be of fire-rated construction).
- In **WAC 296-46B-020(7) and (32)** there are now specific definitions for “appliance” and “household appliance” as the terms are used in rule.
- In **WAC 296-46B-020(20)**, selective coordination of overcurrent devices, as defined in NEC 100, shall be determined and documented by a professional engineer registered in Washington under chapter 18.43 RCW.
- In **WAC 296-46B-030(1) and (2)**, “engineering evaluation” is defined and presented as an option to listing, field evaluation, and department review. For the specific industrial control panels and industrial utilization equipment described in this section, engineering evaluation verifies unlisted equipment is manufactured to appropriate electrical safety standards. An accredited professional engineer may inspect equipment or review documents submitted by the equipment owner and manufacturer for compliance with the requirements of WAC 296-46B-030(2)(d). Engineering evaluation will replace department evaluations since L&I will no longer perform similar review of equipment documentation after December 31, 2006.
- **WAC 296-46B-911** has been amended to include an initial filing fee (\$516.00) and renewal fee (50% of the initial filing fee) for the three-year accreditation period for engineering evaluation (i.e. an engineer evaluating industrial utilization equipment).

- A new section **WAC 296-46B-997(1-24)** describes the accreditation criteria, equipment evaluation and identification process, and the record keeping requirements for engineering evaluation. The department is developing an online application form and cannot begin accepting applications for accreditation until the May 1, 2006 effective date of the rule.

*(If you have specific questions not covered in the complete text of the rules for engineering evaluation, accreditation, or fees you may call Dave Myers at 360-902-5967 or Doug Erickson at 360-902-5742 for additional information.)*

- In **WAC 296-46B-210(1)**, the definition of “kitchens in other than dwelling units” has been removed and the new definition in NEC 210.8(B)(2) will now be applied. The old rule specified “work surface for food or beverage preparation”, while the NEC now states “an area with a sink and permanent facilities for food preparation and cooking.”
- In **WAC 296-46B-210(6)** a counter outlet is not required behind a sink or range, no matter what the dimension “x” is in the diagram (6) below. If none is installed, then there must be a receptacle within 24” on either side of the sink or range as indicated in the diagram and NEC Figure 210.52.



- In **WAC 296-46B-210(7)**, if it is impracticable to install the peninsular counter outlet(s) required in the NEC, they may be eliminated so long as the peninsular counter area extends no farther than 6' from the face of the adjoining countertop. Check for approval from your inspector **prior** to relocating the outlets. Any outlet(s) eliminated must be installed in the wall space at the point where the peninsula connects to the wall, in addition to any that would normally be required in that wall space by the NEC. See diagram (7) above.
- **WAC 296-46B-250(6) and (7)** have been deleted. These specific requirements for multiple grounding of systems and circuits of 1 kV and greater have been replaced by new language in NEC 250.184(C).
- In **WAC 296-46B-555(2)**, it has been made clear that transformer terminations, rather than the enclosure, must be located a minimum of 12" above the deck of a dock. There has been no change to the NEC 555.5 requirement that the transformer and enclosure must be specifically approved for the intended location.
- **WAC 296-46B-905(15)(b) and (c)** have been modified in the fee schedule. Class B random inspection is based on the premise that a licensed contractor or certified electrician should never make an error on the simple work designated as Class B. Modification to subsection (15)(b) makes it clear that a reinspection necessary to verify completion of any corrections issued during a Class B random inspection will be charged per ½-hour (\$36.40) timed from the inspector's previous inspection stop.

Making installation errors on Class B work automatically initiates inspection of another label in the block of twenty. Addition of subsection (15)(c) makes it clear that the fee for such an inspection is based per ½-hour (\$36.40) timed from the inspector's previous inspection stop.

- **WAC 296-46B-920(1) and (2)** both add language clarifying that the minor plumbing work allowed under the plumbing statute (RCW 18.106.150) for the 01 journeyman or 02 residential specialty electrician includes the like-in-kind replacement of the appliance or any component part of the appliance.
- In **WAC 296-46B-920(2)(f)(v)(C)(new bullet 5)** the scope of work for the HVAC/refrigeration (06A) specialty electrician has expanded to include the installation of "a bonding conductor for metal gas piping to an existing accessible grounding electrode conductor or grounding electrode only when terminations can be made external to electrical panelboards, switchboards, or other distribution equipment."
- In **WAC 296-46B-925(17)** the July 1, 2006 expiration date for the electrical utility telecommunications transition equipment installation, maintenance, and repair exemption has been removed from the text.
- In **WAC 296-46B-960(3)** new language is added to allow all of the electrician exams to consist of multiple sections, the same as previously done for the administrator and master electrician exams. All sections must be successfully completed within a one-year period after beginning the examination. The candidate does not have to retake any sections successfully completed within the one-year period. If all sections are not successfully completed within the one-year period, the candidate must begin a new examination period and retake all sections.
- In **WAC 296-46B-995(11)(b)** a technical correction replaces "served on" with "given to" so the appeal requirement now reads: "The appeal must be filed within twenty days after the notice of the decision or penalty is given to the assessed party either by personal service or by certified mail, return receipt requested, sent to the last known address of the assessed party and shall be made by filing a written notice of appeal with the chief electrical inspector, as secretary to the board."
- The following WAC sections are repealed since their deadlines have expired:  
**WAC 296-46B-950**—Opportunity for gaining credit for previous work experience gained in certain specialties.  
**WAC 296-46B-955**—Appliance repair specialty electrician enforcement procedures.

### ● An Overview Of E1, E2, and E3 Training Certificates—Steps To Certification

You are subject to a citation if you are doing electrical work without having a valid electrician certificate or electrical training certificate in your possession. A contractor and the company's electrical administrator are responsible for ensuring all electrical workers have appropriate and active certification for the work performed. The following steps will guide individuals through obtaining proper certification as they proceed in their required electrical training period:

**Step 1:** All trainees begin with the E1 training certificate by submitting an [APPLICATION/RENEWAL FOR AN ELECTRICAL TRAINING CERTIFICATE](#) (\$37.10). With E1 certification, a trainee must work under 100% (constant) supervision while doing work in the 3A, 6B, 7A, 7B, 7C, 7D, 7E, and 10 electrical specialty categories. For any work applicable for training credit in the 01, 02, 03, 04, 06, 6A, or 07 scope of work, trainees must be under supervision for at least 75% of the time spent on any jobsite. A current E1 certificate is required to acquire hours of experience towards qualifying for examination, if work is only in the 01, 02, 03, 04, 06, 6A, or 07 scopes. Commercial or industrial new installation experience towards 01 journeyman certification must be obtained under supervision in a ratio of one trainee per journeyman.

**Step 2:** For 3A, 6B, 7A, 7B, 7C, 7D, 7E, and 10 work, once 720 or 1000 hours of 100% supervised experience is obtained (depending on the specific specialty), a trainee may submit an [APPLICATION FOR AN E2 - 0% SUPERVISION MODIFIED ELECTRICAL TRAINING CERTIFICATE AND SPECIALTY EXAMINATION](#) (\$67.40) to qualify for the exam. The application packet also includes the *AFFIDAVIT OF EXPERIENCE FOR MODIFIED TRAINEE* to document the qualifying experience was obtained under 100% supervision. The licensing staff will send applicants an approval letter or denial letter stating reasons for the denial. An applicant is given one year from the date of the approval letter to successfully complete the examination, or no E2 modified training certificate will be issued.

When we receive notice from LaserGrade that the candidate has passed the examination, we will issue the E2 modified training certificate. E2 certificate holders may work without supervision **only** in the

specialty indicated on the certificate. The E2 modified training certificate will expire two years from the date it is issued. This gives the E2 trainee two years to complete their remaining 1000 or 1280 hours of unsupervised experience (depending on the specific specialty) for a total of 2000.

**Step 3:** When the E2 trainee has 2000 hours they may submit an [APPLICATION FOR SPECIALITY ELECTRICIAN CERTIFICATE \(Eligibility granted through modified supervision requirements of RCW 19.28.191\(1\)\(g\)\(iii\)\)](#) (\$75.60) and the associated *AFFIDAVIT FOR MODIFIED TRAINING EXPERIENCE (0% supervision with E2 certificate)*. This affidavit documents the 0% supervision (unsupervised) hours. The time frame for these hours cannot exceed the expiration date of the E2 certificate. When these requirements are verified, the individual is issued the appropriate specialty electrician certification and may continue to work unsupervised for a contractor as well as provide supervision for new trainees.

An E2 trainee that does not complete the 2000 hours within the two-year expiration date of the E2 certificate must apply for an E3 modified supervision training certificate by submitting an [APPLICATION FOR AN E3 - 75% SUPERVISION MODIFIED ELECTRICAL TRAINING CERTIFICATE](#) (\$44.90). This is the appropriate certificate renewal if an E2 certificate expires. An individual holding an E3 training certificate may only use it to work in the specialty designated on the certificate, until they accumulate the total 2000 hours necessary to complete Step 3 above.

**Note:** If the (3A, 6B, 7A, 7B, 7C, 7D, 7E, and 10) electrical trainee is doing work in another specialty, they must maintain the standard E1 training certificate in addition to either of the modified certificates. Modified training status (E2 and E3) is **always** specialty specific. Although an E1 certificate allows a trainee to work under 75% supervision on each jobsite, it specifically requires 100% (constant) supervision while you are doing work in the 3A, 6B, 7A, 7B, 7C, 7D, 7E, and 10 specialty categories.

● **An Identification Plate Is Required When The Service Conductor Ampacity Is Less Than The Equipment Rating.**

WAC 296-46B-230(6) states *"If the service conductors have a lesser ampacity than the overcurrent protection or the equipment rating that they terminate in or on, an identification plate showing the ampacity of the conductors must be installed on the service equipment."*

For example: An 800-amp rated bus gutter is installed with two 200-amp service disconnects attached with loads of approximately 180 amps on each disconnect. The total calculated service load being supplied is approximately 360 amps. The NEC allows the service entrance conductors feeding the bus gutter to be sized for the 360-amp calculated load, even though they terminate on equipment rated at 800 amps. In this example, an identification plate is required on the 800-amp bus gutter to give a clear indication to the premises owner, the electrical inspector, and future contractors and electricians that may be working on this system that the ampacity of the service entrance conductors is 360 amps (limited). Clear identification of this design limitation will prevent incorrect assumptions and unsafe future load additions to the service.

The identification plate must be a phenolic or metallic plate or other similar material engraved in block letters at least ¼" (6 mm) high. It must be suitable for the environment in which it's installed. The letters and the background must be in contrasting colors. Screws, rivets, or other equally durable methods must be used to affix an identification plate to the equipment or enclosure. The identification plate must be installed plainly visible on the service enclosure where the ampacity limitation exists.

**Note:** 120/240-volt, 3-wire, single-phase dwelling services installed per NEC 310.15(B)(6) will not need an identification plate if the conductor ampacity in Table 310.15(B)(6) and the service equipment ratings are the same. Specific occupancies are allowed to use Table 310.15(B)(6) values (i.e. higher ampacity) for the various sizes of copper and aluminum conductors shown in the table. This is based on the unique load diversity in typical dwelling units.

● **Electrical Question of the Month**

**This Month's Question:** All device and junction boxes 6" by 6" or smaller for NEC 700 emergency systems and circuits must be \_\_\_\_\_ in color, both inside and outside.

A) red, B) orange, C) yellow, D) black.

**Last Month's Question:** When equipment has been recognized as suitable for a specific purpose, function, use, environment, application, and so forth, it is which of the following: A) Approved, B) Listed, C) Identified, D) Labeled. The answer is: C) [NEC Article 100, Definition: Identified].